A Final Update on Achievement of the HIV–AIDS Objectives in *Healthy New Jersey 2000*

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In June 1991, what was then the New Jersey Department of Health released its health objectives for 2000 in a document entitled *Healthy New Jersey 2000: A Public Health Agenda for the 1990s*[1] (*HNJ2000*). The process that resulted in the document encompassed the development of sixty-seven measurable objectives covering eleven priority health areas. The eleven areas included each of the nine priority areas recommended by the Association of State and Territorial Health Officials (ASTHO) in addition to two areas not covered by ASTHO: access to basic health services, and substance abuse prevention and control. The ASTHO priority areas are: infant, child health, and maternal outcomes; adolescent pregnancy; cancer; cardiovascular and other vascular diseases; AIDS and HIV infection; sexually transmitted diseases; vaccine-preventable and other infectious diseases; injuries; and occupational and environmental hazards. In addition to the specific objectives developed for each of the eleven priority areas, two overarching goals served as a guide in the development of the objectives. These were "closing the severe gap between minority and white health status" and "reducing premature death and potential years of life lost."

HNJ2000 was developed to represent the state's response to a national effort set forth in *Healthy People 2000*,[2] which was released in October of 1990. This national set of objectives encompassed three hundred measurable health-promotion and disease-prevention objectives which, if achieved, would improve the health of the nation over the decade. In contrast, the document containing New Jersey's set of health objectives was intended to reflect the specific health needs of the residents of this state, while serving as a companion document to *Healthy People 2000*.

Several assessments of progress made over the decade have been developed, both at the national and state levels. The Department of Health and Senior Services (DHSS) published its first progress report—*Update Healthy New Jersey 2000*[3]—in 1996. The progress on achieving the state's objectives was, in general, monitored through 1992 or 1993 in this first update.

Another New Jersey update was prepared and released in 1999, entitled *Healthy New Jersey 2000 Second Update and Review*.[4] This essentially covered progress in meeting the objectives through 1995 or 1996, depending on the timeliness of the data system used for measurement. This final update is a report of the progress achieved through the year 2000, or the most recent year for which data are available, on each of the objectives in the priority area "prevent and control AIDS and HIV infection."

METHODS

The chapter on prevention and control of AIDS and HIV infection in *HNJ2000* encompassed three objectives: reducing AIDS incidence, HIV-infection death rates, and vertical transmission of HIV from

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mothers to newborns. Each of the objectives had targets set for the year 2000. The objective on AIDS incidence set targets for decreasing the incidence of AIDS for six high-risk sub-groups of the population: children (defined as aged 0–9 years); white non-Hispanic, black non-Hispanic, and Hispanic males 25–44 years of age; and black non-Hispanic and Hispanic females 15–44 years of age. The incidence rate in white non-Hispanic females 15–44 years of age was low relative to the other groups. Thus the rate in this group was not considered a public health problem, so no sub-objective was set. The second objective set targets for decreasing the age-adjusted death rate in the total population and the age-specific death rate in the population aged 25–44 years due to HIV infection. The third objective set a target for decreasing the percentage of HIV positive readings in mothers of newborns.

The data to measure progress on the first objective, related to the incidence of AIDS, were obtained from the HIV–AIDS reporting system (HARS). HARS has collected data on New Jersey residents with HIV–AIDS since 1993, after HIV infection (with or without AIDS) became a reportable condition in New Jersey. HARS incorporated data from the previously existing AIDS reporting system, which collected data on AIDS cases diagnosed from 1979–1992. Incidence of AIDS is defined as the onset of new cases and is represented by the reporting of diagnosed cases of AIDS in HARS. An AIDS case diagnosed and reported to the system is considered an incident case for the year of diagnosis. A person previously diagnosed with HIV infection (but not AIDS) in HARS whose disease progresses to AIDS status is considered an incident AIDS case for the year in which the AIDS diagnosis was made.

Demographic data are collected in HARS by gender, age, and race/ethnicity. Other data encompassed by HARS include mortality status; mode of exposure; year of diagnosis; date of report; and state, county, and municipality of residence. Census data for each age/race/ethnicity/sex group for New Jersey for 1990 and 2000 were used for the denominators for the computation of rates for the decennial years, while the intercensal estimates for the state formed the denominators for the computation of 1991–1999 rates.

The data source for measurement of the second objective, which addressed the death rate due to HIV infection, was the file of resident death records for New Jersey, for each of the years 1990–1998. Death certificates are prepared by hospital personnel, physicians, medical examiners, and funeral directors. Certificates for deaths occurring in New Jersey are transmitted through local registrars to the state registrar for processing and filing. Through agreements sponsored by the national Vital Statistics Cooperative Program, information from death certificates for New Jersey residents are sent to the New Jersey state registrar when these events occur in other states. Information from certificates on out-of-state events is provided for statistical purposes only.

The cause of death used to define an HIV-infection death for measurement of the objective related to decreasing death rates is the underlying cause. The underlying cause of death is defined as "(a) the disease or injury which initiated the train of events leading directly to death or (b) the circumstances of the accident or violence which produced the fatal injury."[5] Causes of death are coded using the rules contained in the *Manual of the International Classification of Diseases, Injuries, and Causes of Death. Based on the Recommendations of the Ninth Revision Conference, 1975.*[5] (ICD-9) for designating underlying cause based on the diseases and/or injuries contained on the certificate and the sequential order of their occurrence. This classification system was used to code causes of death from 1977–1998. The classification system's tenth revision, with new codes and coding rules, became effective in January 1999. The revised coding manual for causes of deaths is the *International Classification of Diseases and Related Health Problems, Tenth Revision* (ICD-10).[6] A change in the classification manual usually causes a disruption in the trend in deaths due to a particular cause. This is a result of, among other factors, changes in the disease entities included in a particular cause code or the rules used to determine underlying cause.

Because of the change in versions of the manual used during the decade, the objectives related to death rates are only monitored through the largest portion of the decade with consistent cause-of-death reporting classification, i.e., 1990–1998. HIV infection was first identified as a separate, identified cause of death in 1987, and the grouped cause was assigned codes 042–044 in *ICD-9.*

Age standardization or age-adjustment of death rates is done to eliminate the effect of the age distribution of the population on the crude death rates, in order to compare health risks between groups or over time. The age-adjusted death rates used in the measurement of the objective for HIV-infection death rates were computed using the direct method. The method consists of applying the actual age-specific death rates to the weighted 1940 standard million population and summing the expected deaths in the standard population to an age-adjusted total per 100,000 standard population.

Progress toward meeting the third HIV–AIDS objective, to decrease the percentage of HIV-positive readings in mothers of newborns, was monitored through results from the Survey of Childbearing Women. HIV antibodies are present in the blood of a newborn in approximately the same concentration as in the mother. Anonymous, unlinked testing of blood specimens for HIV status

from all resident live infants born in New Jersey whose inborn errors of metabolism tests were received by the state Public Health and Environmental Laboratory during July, August, and September of each year provided the yearly estimate of HIV-positive readings in mothers of newborns.

The percentage improvement achieved for each of the objectives and special population sub-objectives was computed through use of a measure called the progress quotient. This measure was developed for use in the *Healthy People 2000 Midcourse Review and 1995 Revisions.*[7] The formula is:

$$\text{Progress Quotient} = \frac{\text{Most recent value–baseline value}}{\text{Year 2000 target–baseline value}} \times 100$$

The resulting number reflects the percentage of the targeted improvement for each objective that was actually achieved over the time period.

RESULTS

All of the objectives and sub-objectives in the AIDS- and HIV-infection chapter achieved positive change over the decade of the 1990s. The target levels were not reached in only two of the sub-objectives for reducing AIDS incidence. In most of the objectives and sub-objectives related to HIV infection and AIDS, the targets set early in the decade were exceeded by a substantial margin (see table 1).

Table 1. Progress Quotients for HIV–AIDS Objectives

OBJECTIVE	AGE	% ACHIEVED
AIDS incidence in black non-Hispanic males	25–44	172.0
AIDS incidence in black non-Hispanic females	15–44	90.9
AIDS incidence in Hispanic males	25–44	193.8
AIDS incidence in Hispanic females	15–44	78.1
AIDS incidence in white non-Hispanic males	25–44	215.7
AIDS incidence in children	0–9	383.3
HIV death rate in total population, age-adjusted		148.7
HIV death rate in total population	25–44	159.6
HIV-positive readings in mothers of newborns		131.6

Table 2. AIDS Incidence Rates* and Year 2000 Objectives in New Jersey

	TOTAL	WHITE NON-HISPANIC MALES	BLACK NON-HISPANIC MALES	BLACK NON-HISPANIC FEMALES	HISPANIC MALES	HISPANIC FEMALES
AGE	0–9	25–44	25–44	15–44	25–44	15–44
1990	7.1	54.2	502.0	145.9	208.9	35.8
2000	0.2	17.1	239.0	103.2	86.2	23.3
TARGET	5.3	37.0	349.1	98.9	145.6	19.8

*Rates per 100,000 population

The two groups for whom the targets were not met were AIDS incidence in 15–44-year-old black non-Hispanic and Hispanic females. The objectives that exceeded the targets by the largest margins were AIDS incidence in 0–9-year-old children (a progress quotient of 383.3) and AIDS incidence in white non-Hispanic males aged 25–44 years (a progress quotient of 215.7).

Substantial progress was made in the reduction of AIDS incidence rates in each of the targeted special groups addressed in the first objective (see table 2). The AIDS incidence rates in 2000 were at relatively low levels for children (aged 0–9 years); for white non-Hispanic males; and among Hispanic females 15–44 years (although the latter group did not meet its objective for 2000). The incidence rate among black non-Hispanic males 25–44 years remained at a very high level (239.0 per 100,000 population), even though it had declined by 52.4% over the decade.

The objectives directed toward reducing the death rate from HIV infection in the total and high-risk 25–44 year age group were both achieved by 1998 (see table 3).

While the total age-adjusted rate from HIV infection declined by 58.3% over the period 1990–1998, the death rate among 25–44 year olds declined at a greater rate, 63.3%.

The target level for positive readings in mothers of newborns in New Jersey, the subject of the third HIV–AIDS objective, had been set for 0.30% for the year 2000, with a baseline of 0.49% in 1990. Results from the Survey of Childbearing Women showed a rate per 100 women of 0.24 in 2000 (data not shown), which meant that the target was achieved. The decrease over the decade represented a percentage decline from the baseline of 51.0%.

CONCLUSIONS

The overall progress in achieving the objectives set to prevent and control AIDS and HIV infection by the year 2000 in New Jersey was notable. With two

Table 3. Death Rates Due to HIV Infection in New Jersey

YEAR	TOTAL RATE,* AGE-ADJUSTED	RATE** IN POPULATION 25–44
1990	19.9	49.9
1998	8.3	18.3
TARGET	12.1	30.1

*Rate per 100,000 standard population
**Rate per 100,000 age-specific population

exceptions, each of the targets was achieved, some by very wide margins.

There are a number of explanations for the reductions in AIDS incidence, the death rates from HIV infection, and for the decline in the percentage of HIV-positive mothers of newborns. One of the most critical factors affecting the incidence of AIDS and the survival of persons with HIV infection was the introduction of protease inhibitors and antiretroviral therapy (ART) during the mid-1990s. Not only did ART slow the progress of HIV infection to AIDS, it also decreased the death rate of persons who were infected with HIV–AIDS.[8,9] In addition, viral load is a major predictor of the risk of heterosexual transmission of HIV-1. It is rare for persons with a viral load of less than 1500 copies of HIV-1 RNA per milliliter to transmit HIV.[10]

Guidelines for the testing of donated blood have virtually eliminated the risk of transmission-related HIV–AIDS. Worksites are required to have regulations to protect workers from occupational exposure to HIV, as well as to other bloodborne infections.[11]

The AIDS Clinical Trials Group Protocol 076 (ACTG 076), a multicenter clinical trial of the antiviral medication zidovudine (ZDV), found that giving ZDV to HIV positive women during pregnancy and labor and to their infants after birth, reduced vertical HIV transmission from 25% to 8%.[12] The introduction of combination antiretroviral therapy and advances in the obstetrical care of HIV-infected pregnant women has decreased the risk of perinatal transmission even further. Reducing vertical HIV transmission has been a public health priority for the New Jersey Department of Health and Senior Services since the ACTG 076 clinical trial results were released in 1994. Since 1995 New Jersey has had a statute and regulations[13] requiring mandatory HIV counseling and voluntary testing of all pregnant women. In addition, public and medical education campaigns were undertaken. The subsequent widespread implementation in New Jersey of the Public Health Service recommendations to reduce the risk of vertical transmission may

be at least partially responsible for surpassing the *HNJ2000* target for the incidence of HIV disease in the 0–9 year age range.

In spite of the impressive progress that has been made in achieving and even exceeding most of the objectives and sub-objectives for high-risk populations related to HIV–AIDS in New Jersey, it should be noted that the two targets that were not achieved by 2000 were those for minority females: AIDS incidence in black non-Hispanic and Hispanic females of the childbearing ages—15–44 years. In addition, although the death rate targets were met in both the total population (age-adjusted rate) and in the younger high-risk age group, 25–44 years, further investigation shows that in 1998 HIV remained the leading cause of death in New Jersey in black males 25–34 years of age (45 deaths, tied with unintentional injury); black males 35–44 years of age (128 deaths); black females 25–34 years of age (36 deaths); and black females 35–44 years of age (81 deaths) (unpublished data).[14] These rankings occurred in a year when HIV infection had fallen from the list of ten leading causes of death in the state.

The differentials in progress in meeting the objectives related to HIV–AIDS in New Jersey raise issues of access to health care and health insurance coverage for all segments of the population. Future study will focus on the health objectives contained in the chapter in *Healthy New Jersey 2010* entitled "Preventing and Reducing Major Diseases: HIV–AIDS."[15] The set of HIV–AIDS objectives for 2010 encompasses a broader set of objectives including an expanded set of targets directed toward high-risk sub-groups of the population.   *NJM*

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